EPCglobal
Enabling Unique Identification and Visibility

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EPCglobal Purpose

Take a _global_ leadership role in developing and promoting _multi-industry_, _user driven_ standards for utilising the _EPC_

Principles:

- Neutral
- Not for profit
- Committed to open and royalty free standards
- User Driven and governed (Government and NGO's often participate in the standards process)
- Part of GS1

GS1 System of Standards

The global language of business

OVERALL BENEFIT: Improving efficiency & visibility in supply and demand chains

GS1 SOLUTIONS & SERVICES USING GS1 STANDARDS
Solutions: POS / Inventory Management / Asset Management / Collaborative Planning / Traceability
Services: Global (GSMP, GEPIR, Global Registry, Training and Accreditation) & Local (e.g. Certification, Implementation, Training)

GS1 System - Integrated system of standards

GS1 BarCodes	GS1 eCom	GS1 GDSN	GS1 EPCglobal
Global standards for automatic identification	Global standards for electronic business messaging	The environment for global data synchronisation	Global standards for RFID-based identification
Rapid and accurate, item, asset or location identification	Rapid, efficient & accurate business data exchange	Standardised, reliable data for effective business transactions	More accurate, immediate and cost-effective visibility of information

GS1 Identification Keys (e.g. GTIN, GLN, SSCC, GRAI, GIAI, GSRN, EPC) & Attribute Data (e.g. Best Before Date)

GS1 around the world

Countries with a GS1 Member Organisation
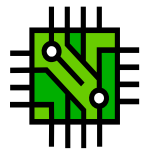
Countries served on a direct basis from GS1 Global Office (Brussels)

108 Member Organisations - 150 Countries served
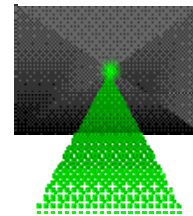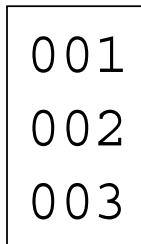**Local reach, global reach**

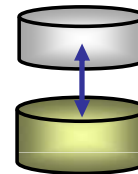# EPCglobal founding principles (2004)
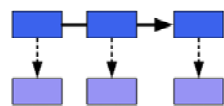
Small, inexpensive, high performance tags

Networked, inexpensive readers

001
002
003

Serialized item tracking

Straightforward link with current systems

Distributed data

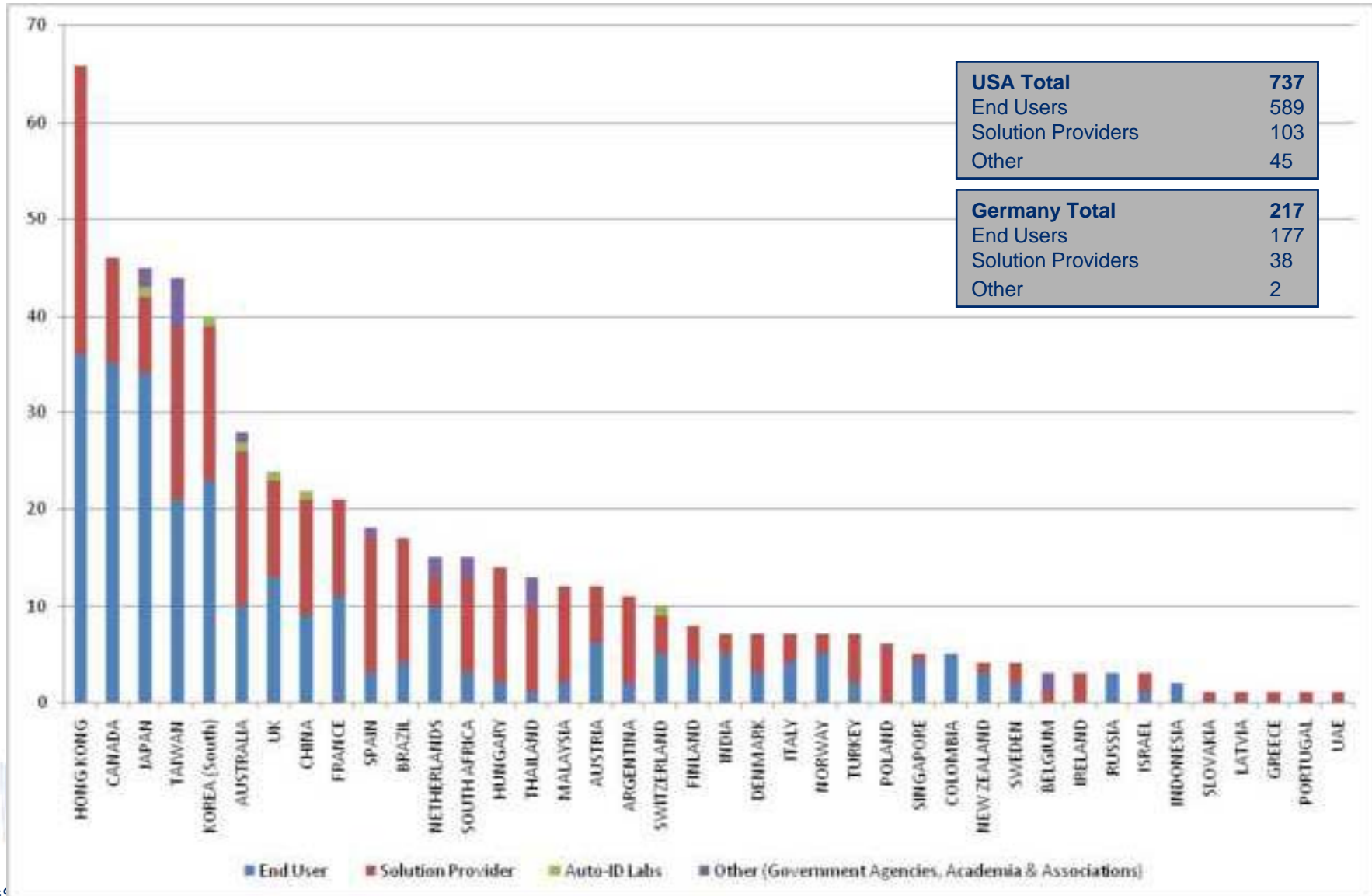Global, multi-industry interoperability

Membership by region

	March 2009
Asia Pacific	288
Europe	390
Latin America	33
ME & Africa	19
North America	783
TOTAL	1513

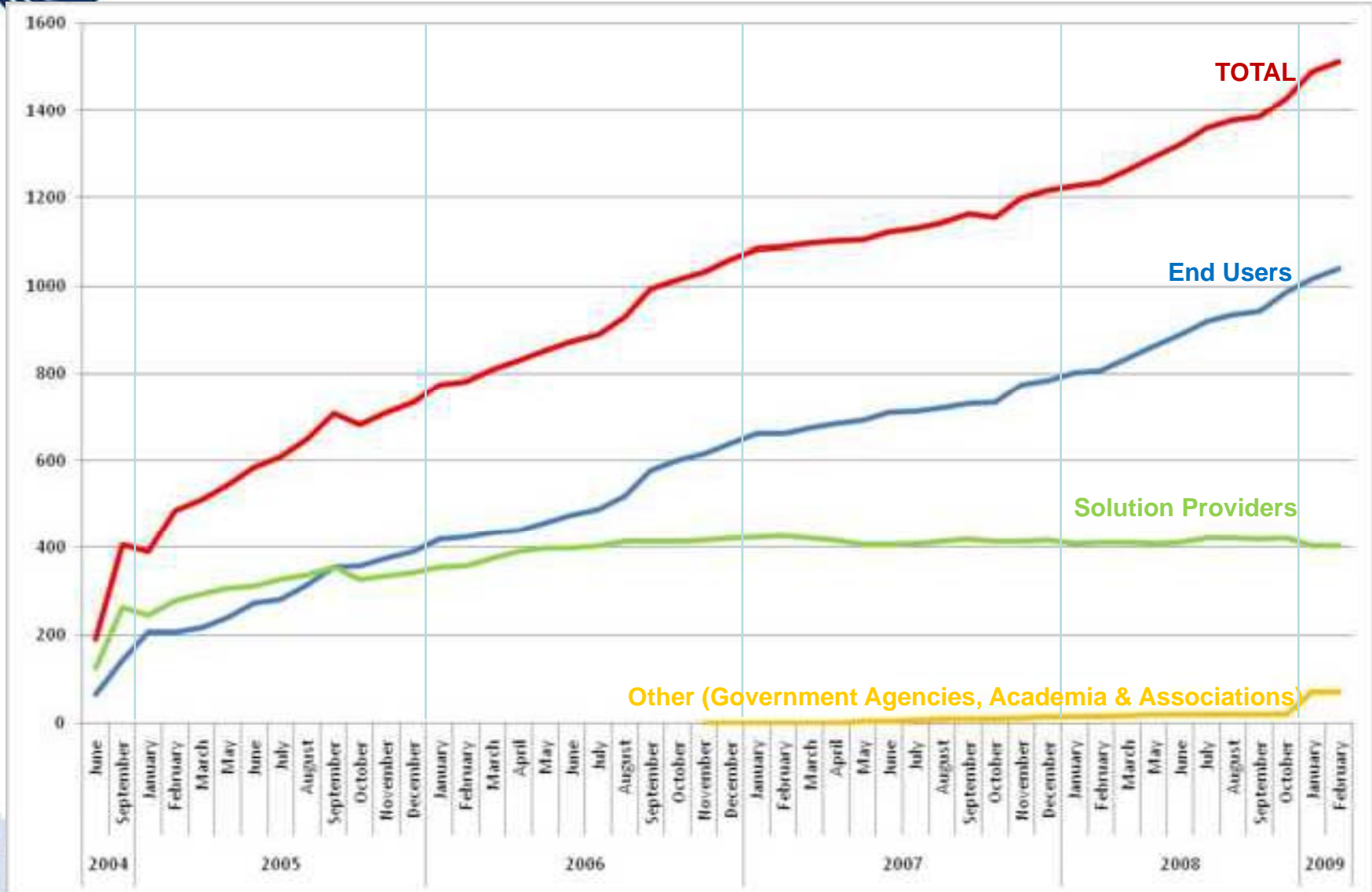Each member joins only once in the location of the global head office

Membership spans 42 countries (March 2009)

USA Total	737
End Users	589
Solution Providers	103
Other	45

Germany Total	217
End Users	177
Solution Providers	38
Other	2

Membership trends 2004 - 2009

Key Industry Activities (alphabetical order)

- Aerospace and Defence
- Agriculture
- Apparel, Fashion and Footware
- Automotive
- Chemical
- Consumer Electronics
- Food and Beverage
- FMCG
- Healthcare

- Information Technology / Computers
- Media and Entertainment
- Packaging
- Publishing
- Retail Supply Chain
- Telecommunications
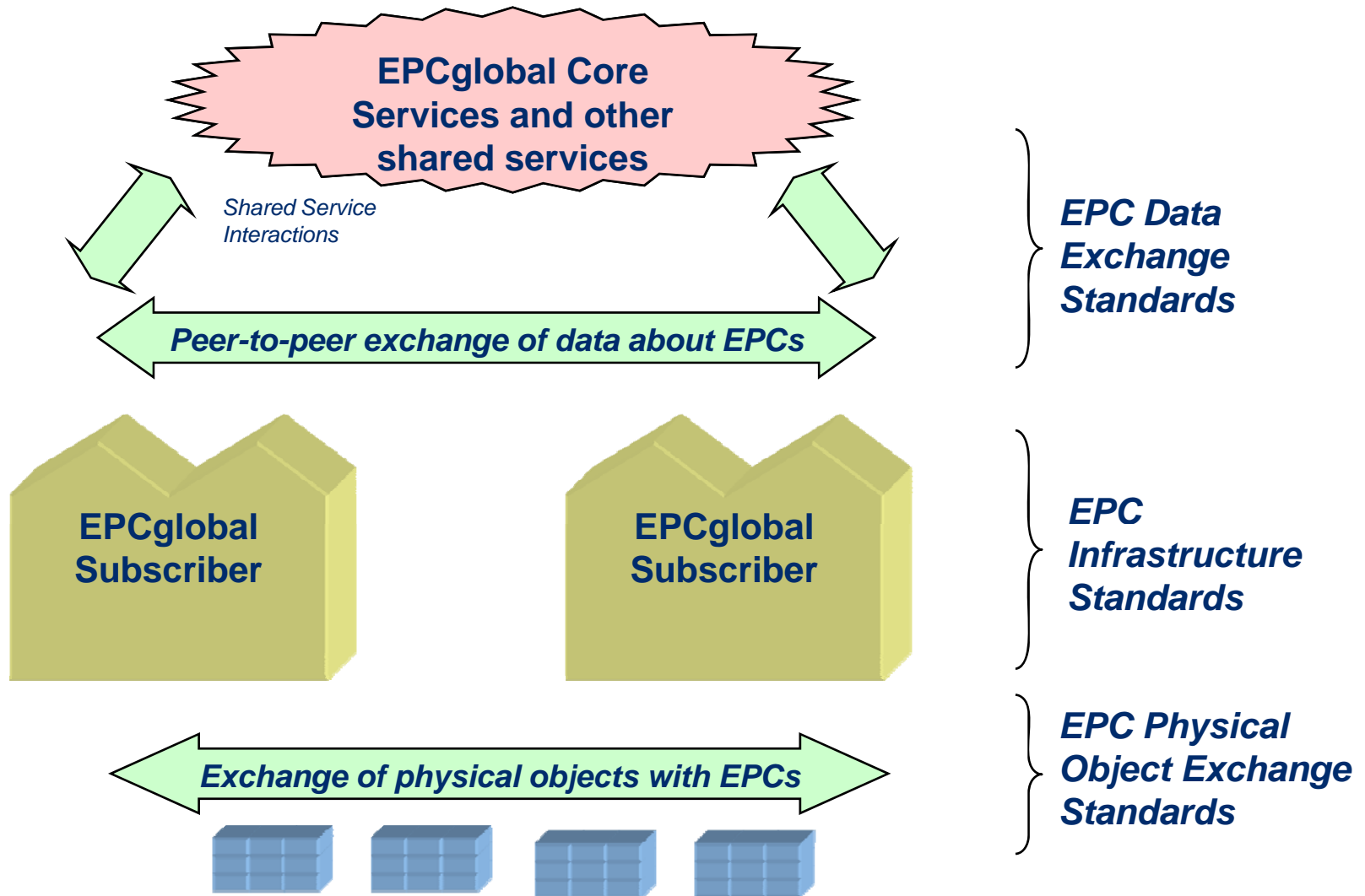- Transportation and Logistics
- Utilities

Why are Global Standard important?

- Standards reduce complexity
  - Within and between organisations
  - For H/W and S/W production and purchase decisions

- Standards reduce cost
  - Implementation
  - H/W, S/W and Integration

- Standards allows organisations to focus more on how to use the information rather than how to get information
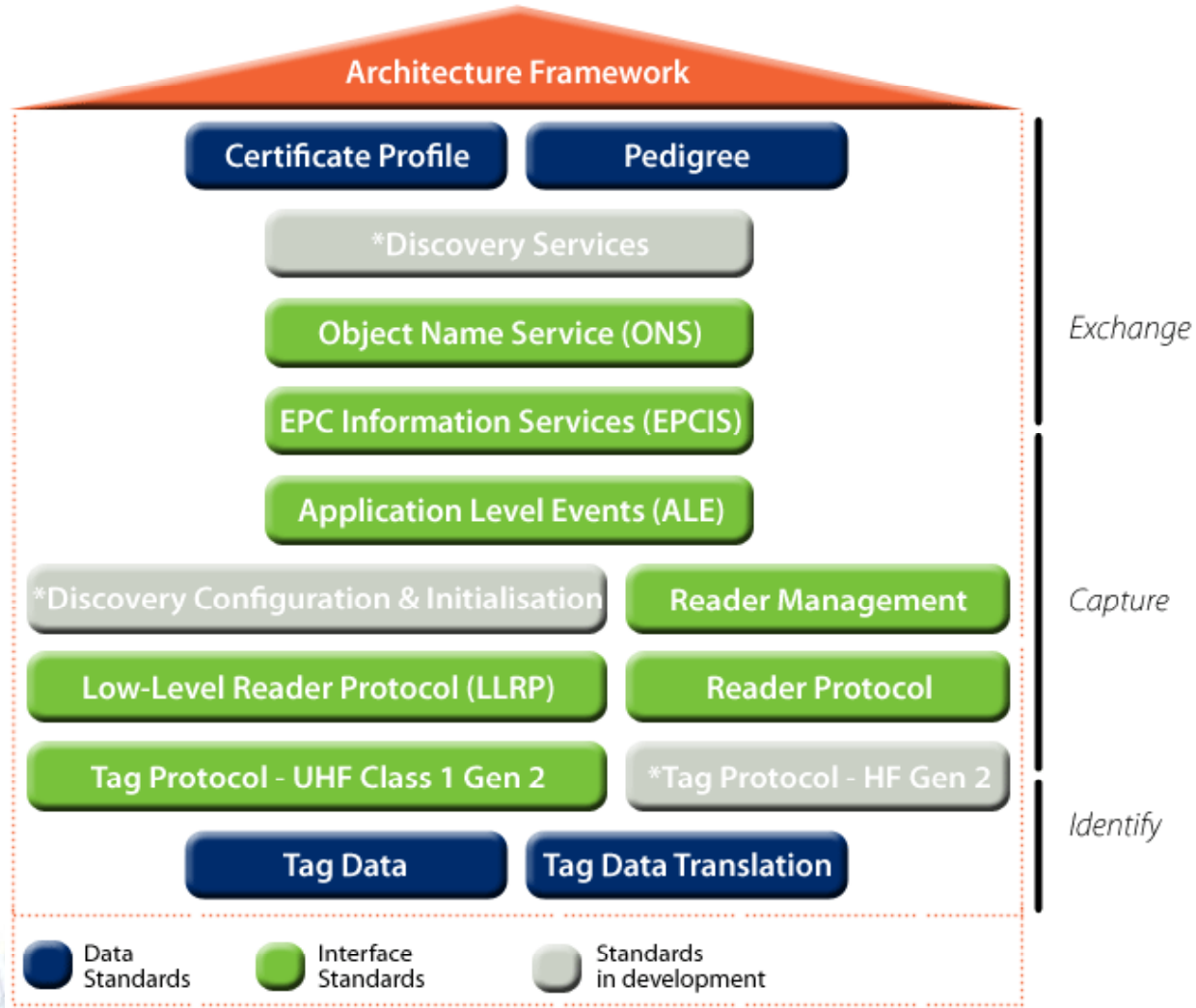
- Certification = confidence

EPCglobal Standards Overview

EPCglobal Core Services and other shared services

Shared Service Interactions

Peer-to-peer exchange of data about EPCs

EPC Data Exchange Standards

EPCglobal Subscriber

EPCglobal Subscriber

EPC Infrastructure Standards

Exchange of physical objects with EPCs

EPC Physical Object Exchange Standards

EPCglobal standards

Architecture Framework

Certificate Profile	Pedigree	*Exchange*
*Discovery Services		
Object Name Service (ONS)		
EPC Information Services (EPCIS)		
Application Level Events (ALE)		*Capture*
*Discovery Configuration & Initialisation	Reader Management	
Low-Level Reader Protocol (LLRP)	Reader Protocol	
Tag Protocol - UHF Class 1 Gen 2	*Tag Protocol - HF Gen 2	*Identify*
Tag Data	Tag Data Translation	

- Data Standards
- Interface Standards
- Standards in development

Vision: An Interconnected World

Manufacturer   **Logistics**   **Retailer** ——— **Consumer**

Product Visibility

Track and Trace/
Anti-Counterfeiting

Targeted
Marketing

Enhanced Consumer
Experience

Visibility Architecture

Trillions of Products
Networked Together

Enterprise   **Business Applications**
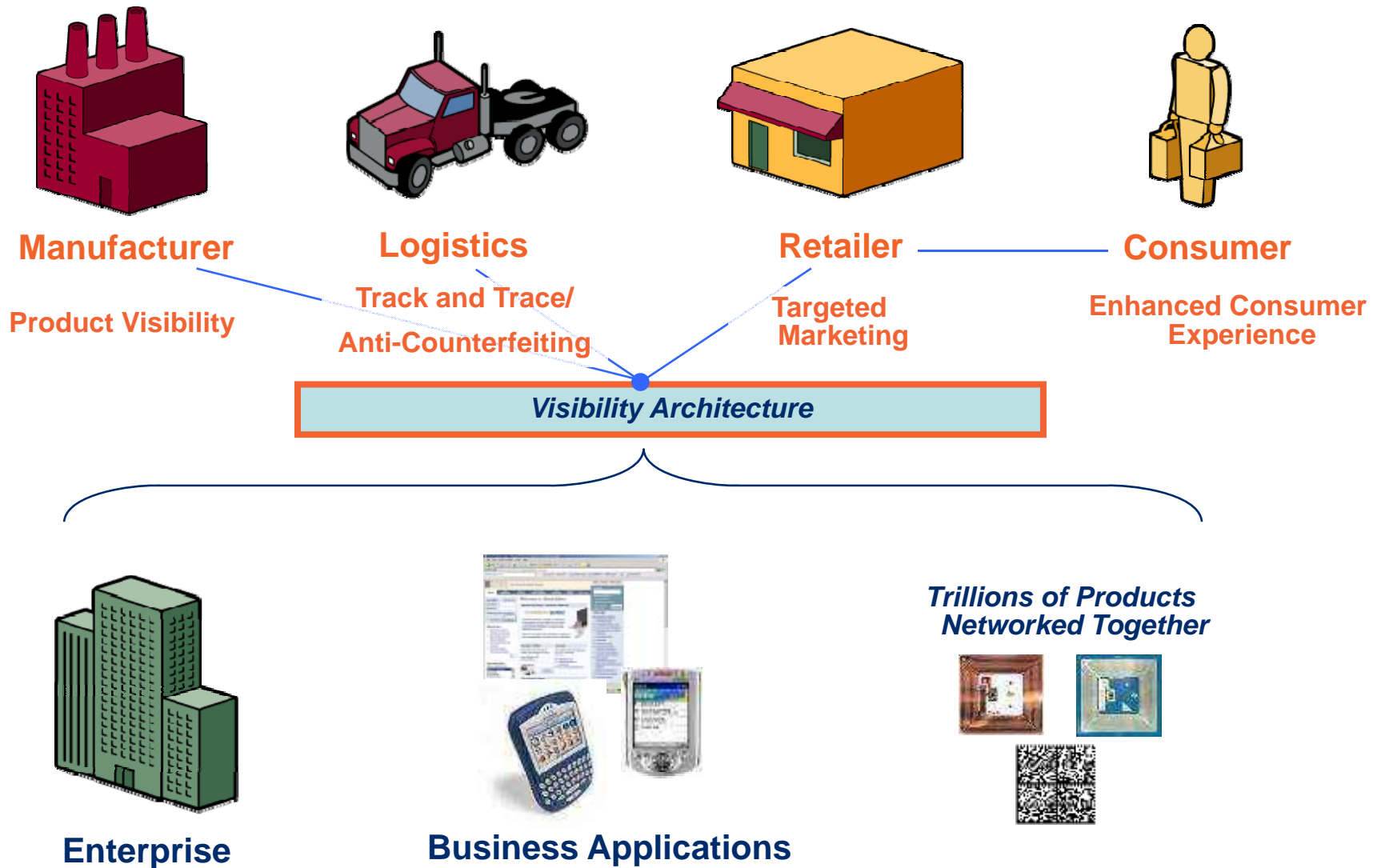
What is Visibility

- Knowing where things are or have been in time, and why;
  - not just within your own four walls, but also within supply chain partners walls
- Understanding the processes that affect the life of an object and its usage
- Providing the ability to answer a broad range of questions
  - i.e. status, current location, change of custody, etc.
- Bringing a newfound awareness of the physical world through supporting standards and systems
- Transformation of business processes through global visibility of products, assets and other "things"

Visibility into the Physical World
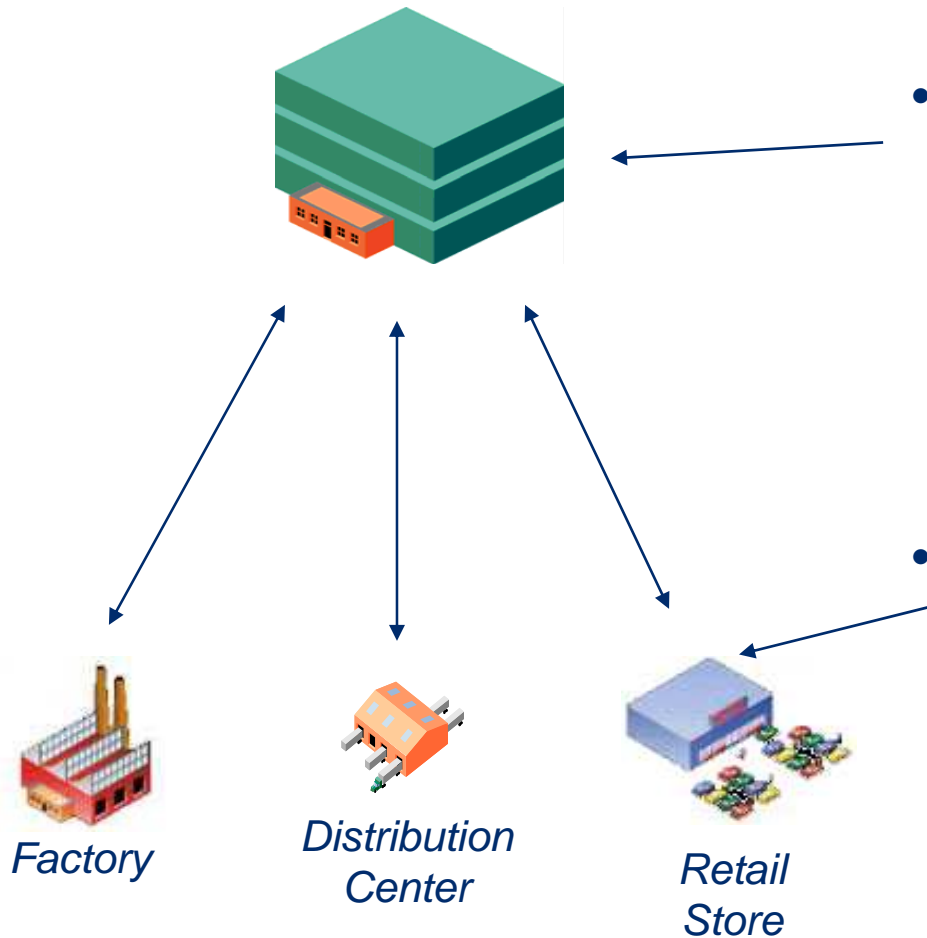
- Business decisions are made here, in the company headquarters data center

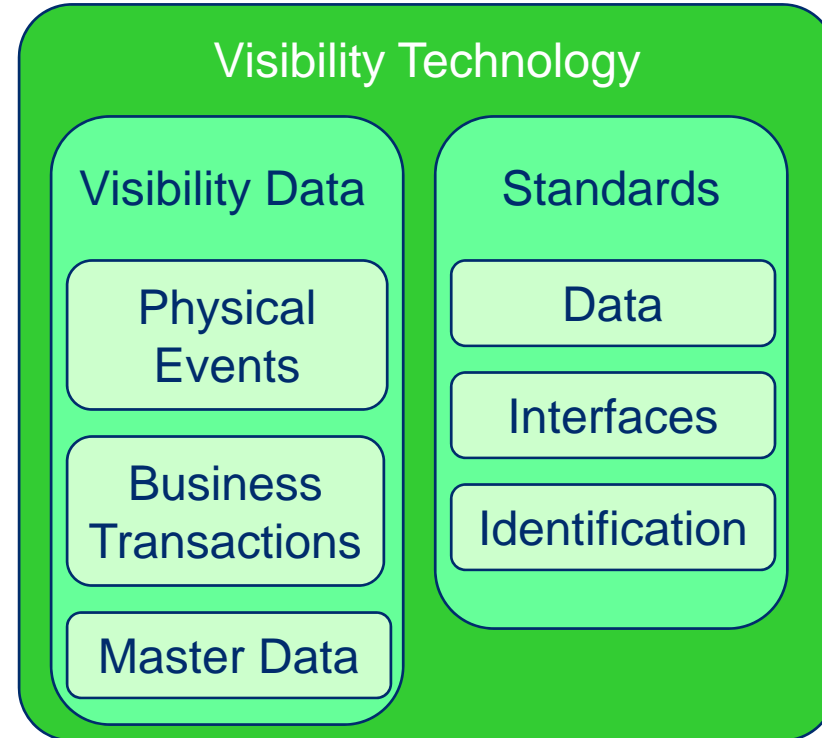- …but there's an awful lot of important action here, in the real world.

Factory

Distribution Center

Retail Store

➔ Visibility into the physical world improves business processes

The Visibility Landscape

Visibility-Driven Business Processes

Track	Trace

Pedigree	Product Authentication

Inventory	Returnables

etc
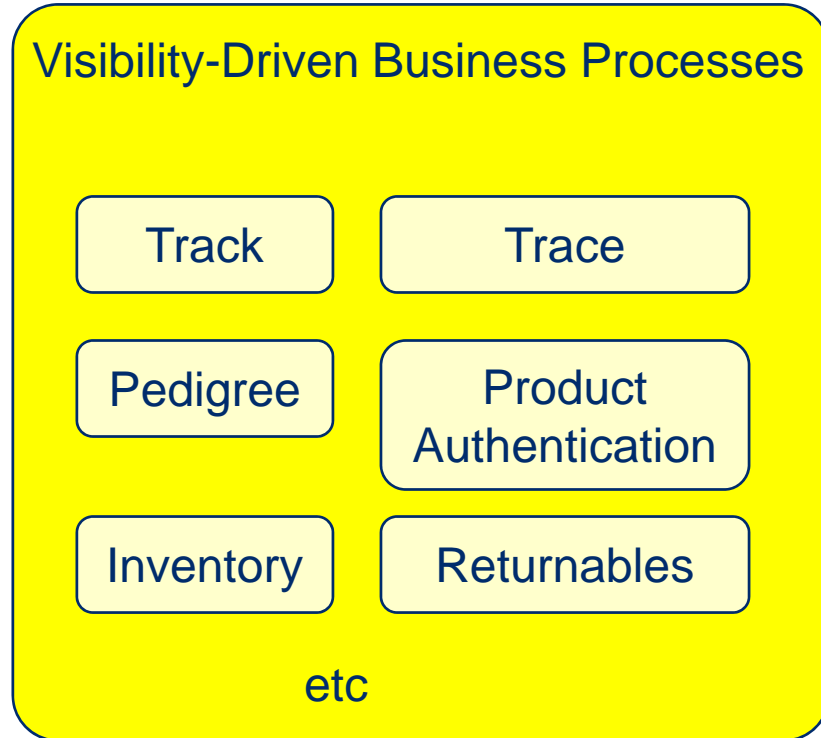
Business processes that rely upon, or are enhanced by, knowing where things are

Visibility Technology

Visibility Data

- Physical Events
- Business Transactions
- Master Data

Standards

- Data
- Interfaces
- Identification

Technology that provides to business processes knowledge of where things are
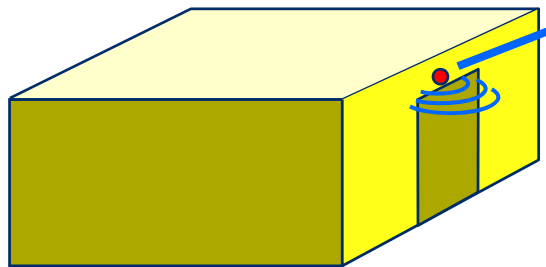
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Visibility-driven Business Processes

- Tracking
  - "Where is my product *now*?"
  - Most recent observation of given physical asset(s)

- Tracing
  - "What is the history of where has my product has been?"
  - Multiple observations of given physical asset(s) through time and space

- Pedigree
  - Who has handled or had ownership of this product?

- Product Authentication
  - Is this product real or could it be a counterfeit?

Using GS1 Identification Keys in EPC

- **Consider this use case:**
  - Hospital storage room that holds radioactive samples
  - Safety officer needs to track what's been in the room and for how long

Visibility Data Stream at Storage Room Entrance		
Time	**Object**	**Key**
9:23am	10cc Syringe #62852	Trade Item (SGTIN)
9:52am	Pharma Tote #2528	Reusable Transport (GRAI)
10:02am	Infusion Pump #52	Fixed Asset (GIAI)
10:52am	Nurse Jones	Employee (GSRN)
11:23am	Patient Smith's chart	Document (GDTI)

- **Any type of object could be "seen" and understood**
  - An EPC can include any GS1 key and additional data as needed

# What are EPCIS and Visibility?

- EPCIS
  - An interface standard for exchanging event related information
    - *What ?*
    - *Where ?*
    - *When ?*
    - *Why ?*
  - Not only EPC but other identifiers
- Visibility
  - Seeing what happened and why it happened
  - Monitoring events, knowing the current or past "status" of things
  - Enabled by EPCIS and, in future, Discovery
  - Must be "Actionable Visibility" in order to deliver value

Business Use Cases for Visibility
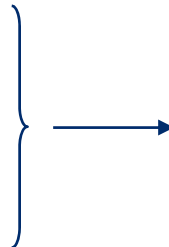
Inventory Visibility

- Product Visibility
- Asset Visibility
- Recalls
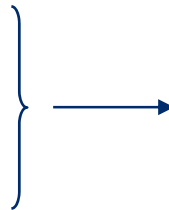
→ **Visibility enables traceability of products**

Brand Protection

- Counterfeit
- Diversion, Gray Market
- Channel Management

→ **Visibility enables traceability and authentication of products**

Chain of Custody

- Track and Trace
- Electronic Pedigree

→ **Visibility supplies the custody information for creating authenticated chain of custody**

EPCglobal standards based implementation

Retail

- Wal Mart
    - RFID enabled stores 63% more efficient stock replenishment
    - 32% reduction in OOS
    - Roll out continues

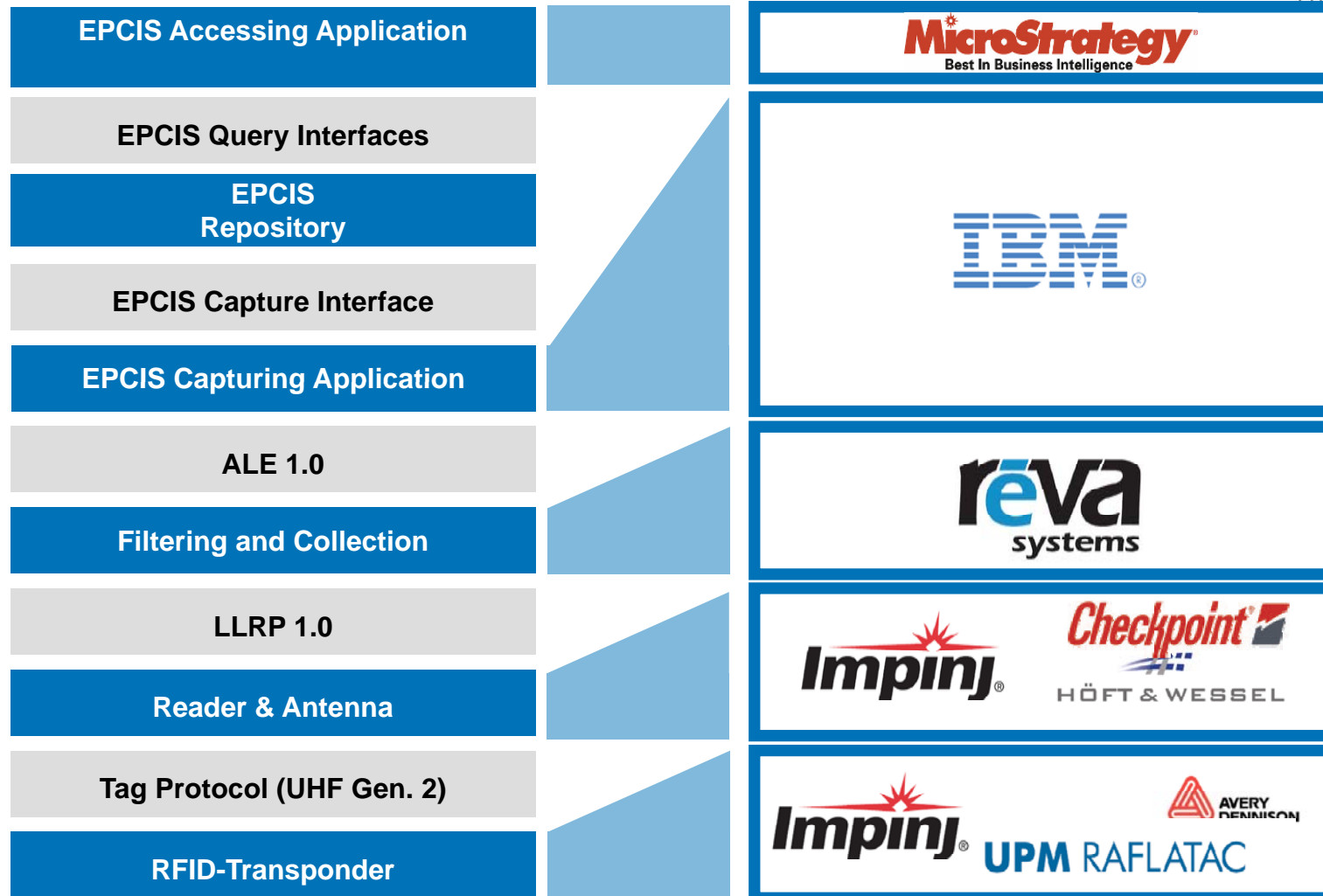# EPCglobal standards based implementation

Retail

- ## Metro
    - Nearly all locations in Germany (9 DCs, 60 C&C, 250 Real)
    - 250 suppliers delivering tagged pallets
    - Future store
    - Galleria Kaufhof department store
        - Identify assets, location and items
        - Improved customer experience
        - Consumer notice
        - Electronic Article Surveillance
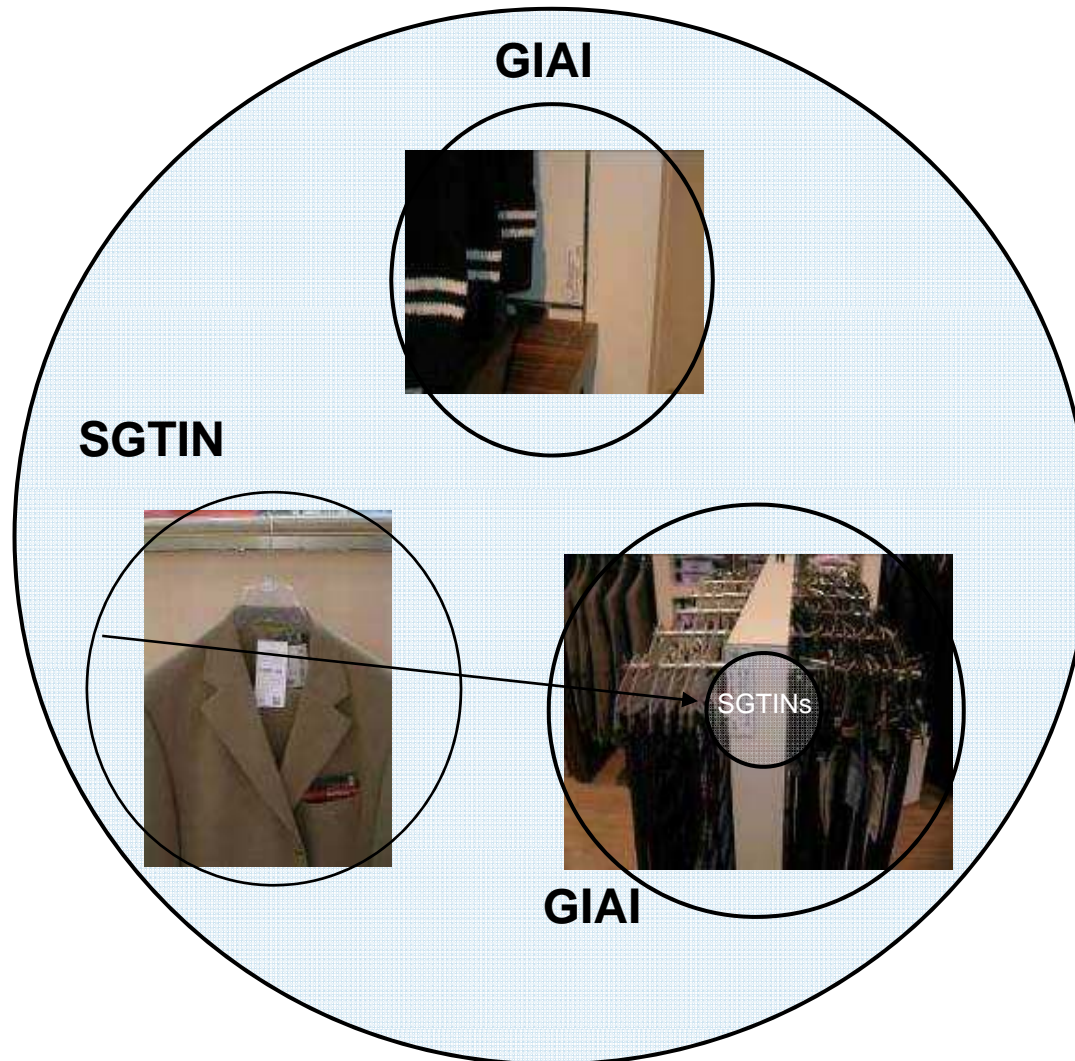   - EPCglobal and GS1 standards used

Use of all EPC ratified Standards

Layer	Vendor
EPCIS Accessing Application	MicroStrategy — Best In Business Intelligence
EPCIS Query Interfaces	IBM
EPCIS Repository	IBM
EPCIS Capture Interface	IBM
EPCIS Capturing Application	IBM
ALE 1.0	reva systems
Filtering and Collection	reva systems
LLRP 1.0	Impinj / Checkpoint / HÖFT & WESSEL
Reader & Antenna	Impinj / Checkpoint / HÖFT & WESSEL
Tag Protocol (UHF Gen. 2)	Impinj / UPM RAFLATAC / AVERY DENNISON
RFID-Transponder	Impinj / UPM RAFLATAC / AVERY DENNISON

METRO Group
Future Store Initiative

In Addition: Use of GS1 Standards

GIAI

SGLN

SGTIN

SGTINs

GIAI

SGLN = Serialized Global Location Number (**store**)

GIAI = Global Individual Asset Identifier (**product carrier**)

SGTIN = Serialized Global Trade Item Number (**article**)

EPCglobal standards based implementation

- DHL
  - France – 6 DCs servicing 89 stores, 1.3 million pallets
  - Dry and beverage logistics
  - Accuracy, efficiency, claims reduction, productivity
- Lockheed Martin
  - Enterprise wide AIT application (2008-2011)
  - Extensive use of EPCglobal standards
- DoD
  - 5000+ supplier delivering tagged products
  - 20+ countries
  - 1500+ sites
  - 2500+ containers tracked per day
  - 180000+ tag reads per month

EPCglobal standards based implementation

- Johnson & Johnson
  - Promotions management
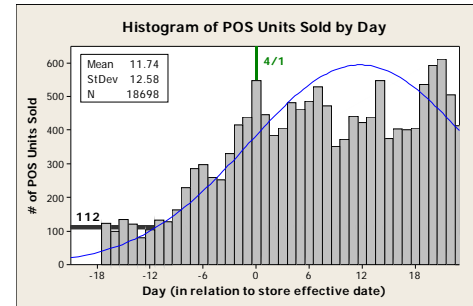
  - High value inventory management – stents

  - Orthopaedic implants

EPCglobal standards based implementation

- Apparel
  - Throttelman Portugal
    - Reception lead time – before 4.97 days, after <24hours
    - Stock reduction 60%
  - Taracci Sweden
    - Automatic checkout
    - Improved customer service
    - Capital reduction -20%
    - Electronic article surveillance
    - Inventory count (2000 items per store). From 24 hours to 5 mins

EPCglobal standards based implementation

- Apparel
    - Major retailer $2.9 bn.
    - Shrink 4.7%, 135mm
    - Use of EPCIS to track product
    - Internal shrink 40% - reduced by 25%
    - External shrink 60% - reduced by 5%
    - Fraudulent returns – reduced by 10%
    - Other inventory and stock management benefits realised

Visibility summary

- EPCglobal and GS1 standards are enabling a level of visibility not previously available

- "Discovery" will complete the puzzle

- Visibility enables valuable use cases

  - From standards to business solutions and enablers of process transformation

- The practical reality will be the integration of multiple EPCglobal/GS1 standards across complex supply chains

- "Its all about visibility" - there are challenges but also a vast world of opportunity….